Attention: Ms Marlene Dortch August 8, 2005

Secretary for The Federal Communications Commission

Dear Ms Dortch,

Enclosed you will find my original and four copies for filing of my reply comments for MM Docket 99-325. Will you give my high regards to Susan Crawford who is doing a great job processing the comments. She is a grand lady and nice to talk to..

Sincerely,

George M. Frese

George M. Frese

REPLY COMMENTS BY GEORGE M. FRESE, P.E.
RADIO BROADCAST CONSULTING ENGINEER

MM Docket 99-325 August 8, 2005

My name is George M. Frese from Wenatchee Washington. A month ago I submitted my first time comments. I had not read any comments prior to that time, and my only knowledge of the proceedings was what I had read in the trade journals. Since that time I have tried to find time to read as many of the comments as possible, and I have succeeded in reading about two thirds of them. This then is my response to what I have read. I would like to respond to all of the comments separately, but that is impossible. I will make comments to just two groups: those that support the Ibiquity technical system and want to have it implemented immediately, including AM nighttime, and those that are against the NRSC-5 standard and the Ibiquity technology digital system.

For and against

A. For the support of NRSC-5 and the Ibiquity IBOC digital system.

1. Ibiquity
2. NPR
3. Clear Channel
4. Walt Disney & ABC
5. Owners, managers, and engineers of radio stations for Ibiquity
6. Audio services for the blind
7. Equipment Manufacturers
8. Large company lawyers
9. Trade journal publications

B. Against the proposed NRSC-5 and the Ibiquity digital system

1. Barry D. McLarnon, P.E
2. Timothy C. Cutforth, P.E.
3. Paul Dean Ford, P.E.
4. Cohen, Dippell, and Everist, PC
5. Leonard R. Kahn, P.E.
6. George M. Frese, P.E.
7. J.S. Gilstrap, Gives no Credentials but he is very knowledgeable
8. Owners, managers, and engineers of radio stations against Ibiquity
9. Listeners, who obviously know what they hear
10. At this point I would like to acknowledge some of the people by name, that I found, whose comments ring true for me: AM Broadcasters association inc, Jesse Beitz, Bueneman, Dick Jeff, Doug Dingus, Gene Beneditson, Dave Forsman, Jim Granger, Bill Harms, Larry Langford, Darwin Long, Richard Kennelly, Donald Mussell, Thomas Olejniezak, John Pavlica, Jim Trapani, Richard Von Zandt; and I am sure there are many others that I have not found.

For

This entire proceeding seems to start with Ibiquity. Many of the supporters above would seem to have substantial investments with the company. For them Ibiquity must succeed, or they stand to lose much in their monetary investment along with Ibiquity. They all strongly encourage the FCC to, as soon as possible, approve the NRSC-5

standards, and the Ibiquity system to get this thing off the ground, believing that it will serve their purpose. According to the trade magazines, things are going pretty well for them, and if the FCC would just give blanket approval of the presently proposed system, then success would be pretty well assured, and so they are led to believe. For the proponents, laws making it legal are all that it would take to make this thing work. They expect that there may be some minor problems along the way, but in this country we have engineers that are plenty smart enough to fix it as we go.

The FCC, with their law, can only put band-aids on some of the problems as they come up, but they cannot change the laws of physics, and that is where many of the problems lie with the Ibiquity digital technique. If blanket approval is allowed, everyone will lose; beginning with the public listeners, the broadcasters, the manufacturers, ibiquity, the FCC, and even public safety will be sacrificed.

Against

I list the P.E.s first because they are the ones most likely to better understand the laws of physics, although the P.E. is not necessary to under physics. The P.E. only means that States have tested and licensed these engineers with a specific engineering skill, and with their first allegiance to protect the general public, regardless of and above their employer's wishes. I only found 6 P.E.s that filed comments, including myself. All 6 are against the proceedings. I strongly recommend that everyone carefully read these comments, and pray about them. They are as close to the truth as you are going to find.

Barry D. McLarnon, P.E. Barry is a Canadian consulting engineer, so he does not have to concern himself with what clients he might offend. He has written four articles, May, June, July, August, for Radio Guide, and my congratulations to Radio Guide for publishing them. Read these articles. He holds a BS degree in Physics, and MS degree in Electrical Engineering.

Timothy C. Cutforth, P.E. Timothy is the director of engineering for Vir James P.C. He has hands on field experience with digital radio and including the Leonard Kahn equipment. Timothy has written five different comments. Read them all and ponder them carefully.

Paul Dean Ford P.E. I have just reread Paul's only comments in the proceedings. Rereading his writings takes my breath away with the absolute truth of his writing. Read Paul's writings. Reread Paul' s writings. They are very understandable and they ring true. I have never heard of Paul until now, but Paul I am proud to know you.

Cohn, Dippell, and Everest, PC. They constitute a P.C. firm. They are professional in every way as PC stands for Professional Corporation. Their purpose is to provide broadcast engineering services between broadcasters and the FCC. They are concerned that in MM Docket 99-325, the Commission is losing sight of the earlier goals of the Commission as set forth in MM Docket No. 87-267, that of reducing the clutter on the broadcast band that had been developing over the years.

Leonard R. Kahn, P.E. Before I say anything about Leonard Kahn, I want to briefly talk about Major Armstrong. Major Armstrong is one of the great all-time radio inventors. He invented the neutradyne receiver, allowing triodes to be used as r-f

amplifiers, the regenerative-detector, the super-regenerative detector, the super heterodyne receiver, and broadband frequency modulation. These are major inventions, without which there would be almost no radio today.

Leonard Kahn's inventions are of the Armstrong caliber. His understanding and development of AM modulation processes are above and beyond the present modulation processes (that of using mirror image sidebands). His methodology uses less bandwidth to achieve the same and better results. Listen to Leonard's comments. He speaks the truth.

J. S. Gilstrap In the J. S. Gilstrap comments, he offers us no credentials to back up his knowledge and wisdom. I find that refreshing. He starts right out; "IBOC in its present form on the AM band would most likely be a step backward.... "He writes three close space pages of technical truth. Look up his comments and read them for more insights as to what is going on here. I would like to know Mr. Gilstrap.

Owners, Managers, and Engineers of Radio Stations against Certainly not all radio personnel are in favor of IBOC digital radio in the form that it has been presented. I ran into a number of station's personnel comments against, too numerous for me to mention here, but I would like to congratulate all of them for their insights as to the technical side of their business.

Listeners who obviously know what they hear There have been many filings by listeners that know what they are hearing. They describe it well and I hope the judges of this project will listen well to their comments. They are obviously true and maybe the best proof we have to date as to just how bad the adjacent channel interference really is. Obviously it is harder to tell just how serious the reduction of distant coverage will be, but we can be quite sure that it will be substantial.

Public Safety

My next topic is public safety, because at this very moment as I write, KPQ 560 kHz, 5 KW in Wenatchee, Washington is transmitting warnings to the citizens around Dirty Face Mountain at the west end of Lake Wenatchee to evacuate or prepare to evacuate do to the fire danger. This is a considerable distance away from Wenatchee, deep into the Cascade Range where the signal strength is probably 50 to 100 uV/m. and the best signal available. It would be a dirty shame if this service were to be removed from the public by the proposed IBOC digital radio system.

ANTENNA TALK

Comments on the subject of AM broadcast antennas have been mentioned as if the antenna presents only a minor problem to Ibiquity digital, and which, if there are any problems, they can be easily corrected by the engineers. Let us take a closer look at it. The AM broadcast band allocates only a very narrow piece of the spectrum for each station, which is just barely enough for an AM analog double sideband system.

The measurement for bandwidth is merit Q. A Q of 0 would represent an infinite bandwidth (not possible with antenna). A dummy antenna, used to test transmitters without radiation resistance, might have a Q as low as 1. The best-broadcast antenna may have a Q as low a 5. A poor antenna can have a Q of 50 or more. There is 3 times as much useable band pass width at 1700 kHz as there is at 540 kHz. Ibiquite IBOC transmitter manufacturers have come up with a VSWR figure of 1.4 at ±15 kHz from the

carrier frequency. This equates to a Q of 6.8 at 600 kHz, 11.8 at 1000 kHz, and 17.0 at 1500 kHz.

There are only two main factors that determine the Q of a vertical broadcast tower: (1) the height of the tower, (2) the frequency of the carrier. The majority of antennas used for class B service at 600 KHz are at the minimum height of 300 foot, as determined by the FCC curve figure 7. This equates to a Q of 10.8, which is considerably above the value of 6.8 needed for the IBOC transmitter. Increasing the tower diameter with wire skirts, or top loading, or a unipole configuration will only have negligible effect toward lowering the Q. All reactive elements used in the feed system, such as the antenna-tuning unit, traps, multiplexing, phasing, branching, and common point matching, will only add (increase) to the Q value as the transmitter sees the load. Reactive components will not work in any configuration to lower the original antenna Q. There are many low frequency stations for which their only solution is to raise the height of their antenna to maybe 400 feet, and there will be some stations that cannot do that. For many stations there will be no available antenna solution without compromising the integrity of the band-pass. Non-directional towers (single tower) above 800 kHz should be ok, except for many of the directional antennas, multiplexed antennas, and direction multiplexed antennas. For a number of these stations, there will be no solution. It does not seem right or fair to initiate a new system for which some stations cannot find an antenna solution to radiate a standard quality signal.

My final comment, AM Nighttime. I think those for it and those against it have spoken. Those for it, seemingly have no regard for the inherent physical nature of sky wave propagation. They want it to work, because that is what is needed for the success of the IBOC digital program. Those against it have a more realistic view. Adjacent channel white noise over great distances has already shown its ugly self. What about the number of times the hybrid system will be switching back and forth, or blank out if there were no analog hybrid backup. And if a class 1 station has no further interest in its nighttime secondary sky wave service, the ground wave will still be in trouble in close in areas where the sky wave intensity begins to equal the ground wave intensity. That's not much coverage for a 50 KW class 1A or 1B.nighttime station. What is the point of further field experimentation with a system like this?

A Philosophical Ending

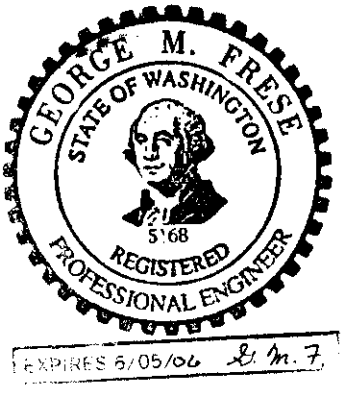
Addressed to everyone reading these comments. Don't throw away tomorrow by following somebody else's pipedream today. Pipedreams are caused by a flawed understanding of the needs of the people, natural laws of physics, along with an overactive ambition for personal gain.

Respectively Submitted,

George M. Frese, P. E.

George M. Frese P.E.

Original



8/8/2005